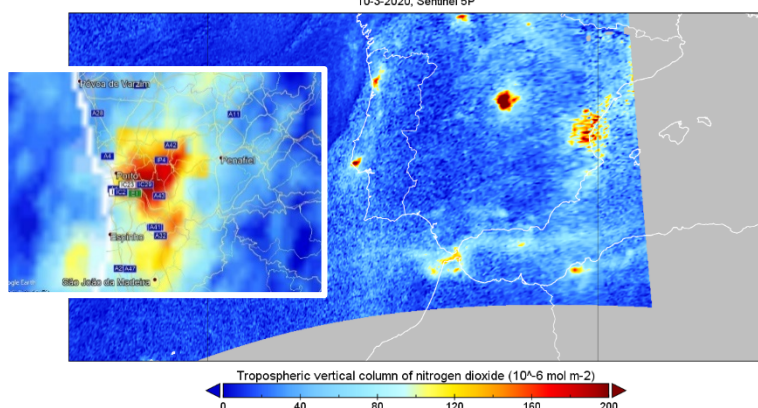


NO₂ EMISSIONS IN PORTUGAL DURING COVID-19 OUTBREAK

Nitrogen Dioxide (NO₂) is generated by vehicles, heavy industry and power plants, which have been shut down during the corona virus pandemic. The main effects of breathing NO₂ relates to the increase of probability of respiratory problems as in high doses it could inflame the lining of the lungs and reduce immunity to lung infections, causing problems like coughing, colds and bronchitis. The following images depict the timeline of NO₂ emissions during the COVID-19 outbreak in Portugal and Spain, images from European satellite Copernicus Sentinel 5P using TROPOMI (Tropospheric Monitoring Instrument). The images show a drastic reduction in NO₂ contamination levels due to reduced industrial activity, which helps mitigate the impact of the COVID-19 outbreak.

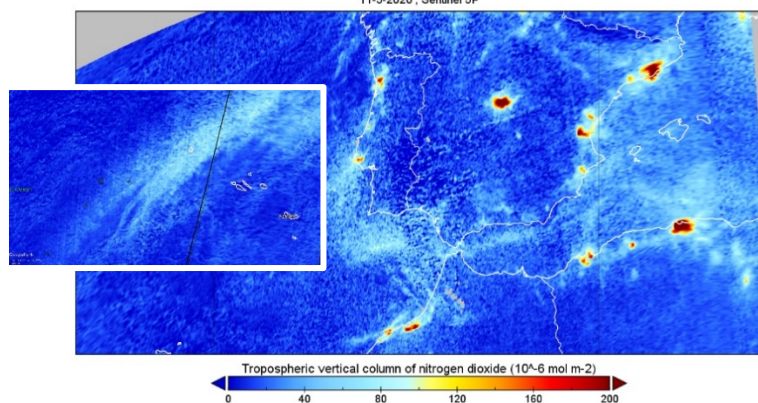
Tropospheric vertical column of nitrogen dioxide
10-3-2020, Sentinel 5P



10TH MARCH 2020

- Closing of museums, theatres, monuments, and sport activities in closed areas
- Flights to Italy closed for 14 days

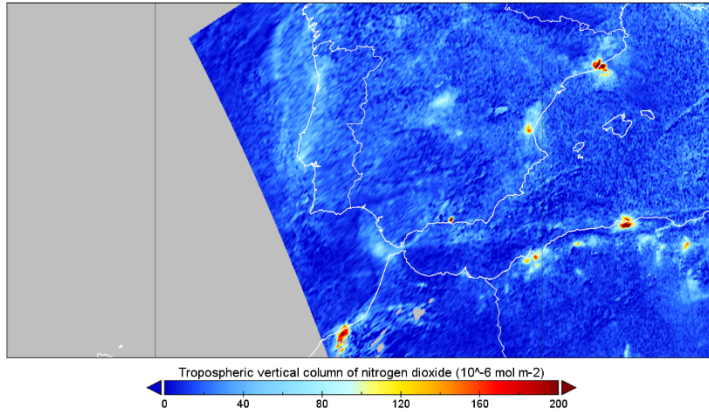
Tropospheric vertical column of nitrogen dioxide NO₂
11-3-2020, Sentinel 5P



11TH MARCH 2020

- More than 1000 doctors volunteer to reinforce the national health service
- OMS declared COVID-19 as pandemic
- Announced that all schools will be closed in the following days

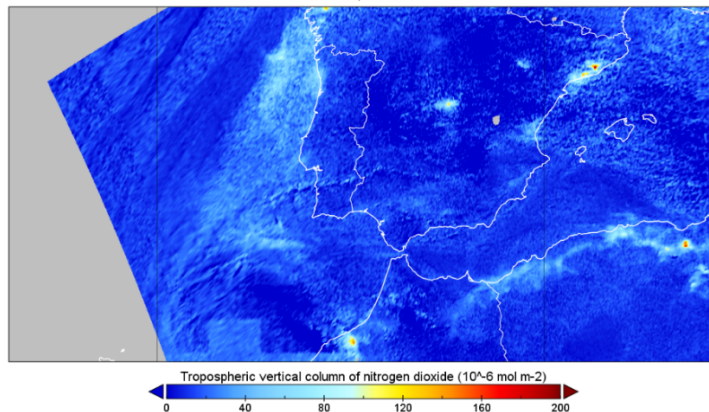
Tropospheric vertical column of nitrogen dioxide
14-03-2020, Sentinel 5P



14TH MARCH 2020

- Spain includes drastic measures, forbidding citizens going to the street except for working, food and pharmacy

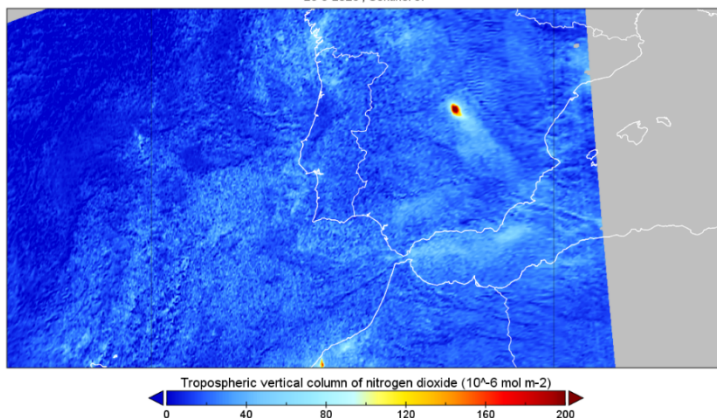
Tropospheric vertical column of nitrogen dioxide
18-3-2020, Sentinel 5P



16TH – 18TH MARCH 2020

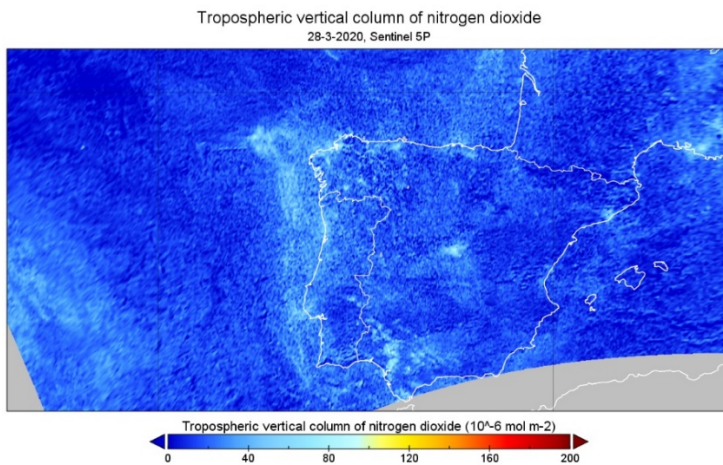
- 1st death in Portugal
- Boarder control with Spain enacted
- Declared state of Emergency

Tropospheric vertical column of nitrogen dioxide
26-3-2020, Sentinel 5P



26TH MARCH 2020

- Daily air traffic at Portuguese airports dropped 87%
- Banco de Portugal (BdP), warns about severe economic impact on growth and unemployment
- Schools will not be returning for the 'third period' (summer term)



28TH MARCH 2020

- ‘Stay at home’ policy is apparently causing flattening of the curve (of new cases needing hospital treatment)

The Atlantic International Research (AIR) Centre is an international networked institution, based on Terceira Island, Azores, aimed at promoting job creation and sustainable economic development in the Atlantic regions, through the integration of space science, climate, land, ocean, energy and data. The AIR Centre promotes South-North / North-South cooperation in line with the national / regional priorities of the Atlantic countries and global challenges, such as the United Nations 2030 Agenda for Sustainable Development, the Decade of Science of the Ocean, the Paris Agreement and the Sendai Framework for Disaster Risk Reduction 2015-2030.

AIR CENTRE - ATLANTIC INTERNATIONAL RESEARCH CENTRE

Headquarters: Rua Gervásio Lima, SN, 9760 – 472, Praia da Vitória, Açores - Portugal.

Lisbon Office: Palácio das Laranjeiras. Estrada das Laranjeiras, 205 1649-018 Lisboa- Portugal

Telephone: +351 21 723 10 62

Email: info@aircentre.org

ESA LAB@Açores Director: Pedro Freire da Silva +351 962 930 076

Images generated using Copernicus Sentinel data from 2020.

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